§ 75.703 Grounding offtrack direct-current machines and the enclosures of related detached components.

[STATUTORY PROVISIONS]

The frames of all offtrack direct-current machines and the enclosures of related detached components shall be effectively grounded, or otherwise maintained at no less safe voltages, by methods approved by an authorized representative of the Secretary.

§ 75.703–1 Approved method of grounding.

In instances where the metal frames both of an offtrack direct-current machine and of the metal frames of its component parts are grounded to the same grounding medium the requirements of § 75.703 will be met.

§ 75.703–2 Approved grounding mediums.

For purposes of grounding offtrack direct-current machines, the following grounding mediums are approved:

(a) The grounded polarity of the direct-current power system feeding such machines; or,

(b) The alternating current grounding medium where such machines are fed by an ungrounded direct-current power system originating in a portable rectifier receiving its power from a section power center. However, when such a medium is used, a separate grounding conductor must be employed.

§ 75.703–3 Approved methods of grounding offtrack mobile, portable and stationary direct-current machines.

In grounding offtrack direct-current machines and the enclosures of their component parts, the following methods of grounding will meet the requirements of § 75.703:

(a) The use of a separate grounding conductor located within the trailing cable of mobile and portable equipment and connected between such equipment and the direct-current grounding medium;

(b) The use of a separate ground conductor located within the direct-current power cable feeding stationary equipment and connected between such stationary equipment and the direct-current grounding medium;

(c) The use of a separate external ground conductor connected between stationary equipment and the direct-current grounding medium; or,

(d) The use of silicon diodes; however, the installation of such devices shall meet the following minimum requirements:

(1) Installation of silicon diodes shall be restricted to electric equipment receiving power from a direct-current system with one polarity grounded;

(2) Where such diodes are used on circuits having a nominal voltage rating of 250, they must have a forward current rating of 400 amperes or more, and have a peak inverse voltage rating of 400 or more;

(3) Where such diodes are used on circuits having a nominal voltage rating of 550, they must have a forward current rating of 250 amperes or more, and have a peak inverse voltage rating of 800 or more;

(4) Where fuses approved by the Secretary are used at the outby end of a trailing cable connected to electrical equipment employing silicon diodes, the rating of such fuses must not exceed 150 percent of the nominal current rating of the grounding diodes;

(5) Where circuit breakers are used at the outby end of a trailing cable connected to electrical equipment employing silicon diodes, the instantaneous trip setting shall not exceed 300 percent of the nominal current rating of the grounding diode;

(6) Overcurrent devices must be used and installed in such a manner that the operating coil circuit of the main contactor will open when a fault current with a value of 25 percent or less of the diode rating flows through the diode;

(7) The silicon diode installed must be suitable to the grounded polarity of the power system in which it is used and its threaded base must be solidly connected to the machine frame on which it is installed;

(8) In addition to the grounding diode, a polarizing diode must be installed in the machine control circuit to prevent operation of the machine when the polarity of a trailing cable is reversed;